

REMARKS/ARGUMENTS

The Examiner's attention to the present application is noted with appreciation.

In Section 5 of the Office Action dated June 22, 2004, the Examiner rejected claims 5 and 7 under 35 U.S.C. § 112, second paragraph. Applicant has amended claims 5 and 7 to depend on claim 1 rather than on claim 4.

In Section 7, the Examiner objected to claim 17. Applicant has amended claim 17 to correct the typographical error by substituting "hydrogen is" for "hydrogenix". Applicant has also corrected typographical errors in claims 9 and 18.

In Section 8, the Examiner objected to the title as being too long. Applicant has amended the title to shorten it.

In Section 2, the Examiner rejected claims 1-6 and 9-19 under 35 U.S.C. § 103(a) as being unpatentable over U. S. Patent No. 4,912,152 (to Nejigaki et al.). That rejection is traversed. The invention and disclosure of Nejigaki et al. is distinct from the present invention in several significant ways to the extent that Nejigaki et al. does not make the present invention obvious.

First, Nejigaki et al. disclose the use of high pressure to obtain a full reaction product. (See Nejigaki et al., Tests 3, 4, and 5 at columns 10 and 11). The present invention does not depend on the use of high pressures.

Second, Nejigaki et al. describe a curing time sufficient for the coating mixture to become a gel that provides a sufficient contra-pressure. (See Nejigaki et al., Test 2 at column 9, lines 51-67). It is known in the art, however, that such a gel may be formed when only approximately 15-20% of the material is cured. Therefore Nejigaki et al. do not describe the time required to achieve a complete curing. Applicant has amended claim 1 to clarify that the curing times claimed for the present invention are for complete curing.

Third, Nejigaki et al. describe and claim that polyhydrazides are dispersed directly into a polyisocyanate. (See Nejigaki et al., claim 1; column 1, lines 50-57; Examples 1, 5, and 8 at columns 7, 8, and 9). The present invention, however, discloses and claims a two-pot system in which a compound containing hydrogen is first dispersed in a material that contains no groups that are reactive to the

compound. The resulting dispersion is then mixed with the polyisocyanate. Therefore, claim 1 taught away from Nejigaki et al. The basis for the claimed distinction is instructive. By dispersing the polyhydrazide in a non-reactive material results in a smaller particle size than when a solid is ground. (See Application, page 4, lines 1-5; Example 14 on page 16). Another advantage is that, because the reaction area is enlarged, the curing time with a polyisocyanate is shortened. Also, in obtaining dispersions with a small particle size of polyhydrazides in a non-reactive medium, the temperature rises to approximately 60-80 degrees Celsius. Under those conditions, it is not possible to disperse polyhydrazides directly into a polyisocyanate because the reactive groups begin to react and the mixture gels. Another advantage is that pure ground polyhydrazide is very dusty and so is difficult to manage and unsafe to work with. By dispersing it in a non-reactive material, these problems are avoided. Also, because of the lessened curing time, the present invention results in strong and flexible coatings with unique properties as shown by the excellent mechanical properties of the resulting films, such as high stress and strain values, good tear resistance, and good chemical resistance.

Accordingly claim 1 is patentable. Claims 2-6 and 9-19 are either dependent on claim 1 or recite the method of claim 1. Therefore claims 2-6 and 9-19 also are patentable.

In Section 3, the Examiner rejected claims 1 and 13-16 under 35 U.S.C. § 103(a) as being unpatentable over U. S. Patent No. 3,014,009 (to Levine). Applicant has amended claims 1, 5, and 14 to show that the reaction with the polyepoxide does not include carbodihydrazide. Accordingly, claims 1, 5, and 14 are patentable. Claim 13 refers to the method of claim 1 which is patentable. Therefore, claim 13 also is patentable. Claim 15 is dependent on claim 1, and claim 16 is dependent on claim 14. Therefore, claims 15 and 16 also are patentable.

In Section 4, the Examiner rejected claims 1-6 and 9-19 under 35 U.S.C. § 103(a) as being unpatentable over WO 97/19124 (by White et al.). The rejection is traversed. White et al. disclose the preparation of a solid epoxide functional powder that is heat-curable. First, an epoxy-functional resin or compound is reacted with an amine-solidifying system. At that stage, the hardener is not yet reacted. The product, as recited in claim 1 of White et al., is a powdered solid. Because the epoxy-functional resin or compound is still present and the hardener has not yet reacted, the material may be cured by subjecting the powder to higher temperatures so that an expanding agent that is present in the mixture results in a

foamed product. The disclosed process differs from the present invention in that: (1) the present invention comprises a liquid, not a powder, and so is easier to manage, safer to work with, and may be used in spraying applications; (2) the present invention does not comprise the step of first reacting the epoxide with an aminosolidifying system as does the process of White et al.; (3) the product of White et al. is a very hard product because the partially reacted product is already in powder form by the time it is further hardened with low-molecular weight hardeners, whereas the present invention results in flexible coatings; and (4) oxybisbenzene sulphonylhydrazide is a foaming agent (commercially available as Celogen OT (from Crompton Europe – a product data sheet is attached to this response)) that White et al. utilize as an expanding agent, whereas the present invention does not use the compound as an expanding agent, but rather as a reactant. The use of the compound as a reactant is the result of the discovery by Applicant that the compound is useful for that purpose.

White et al. teaches away from the present invention. Accordingly, claim 1 is patentable. Claims 2-6 and 9-19 are either dependent on claim 1 or recite the method of claim 1. Therefore, claims 2-6 and 9-19 also are patentable.

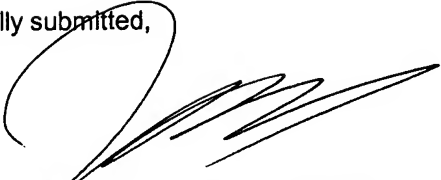
In view of the above amendments and remarks, it is respectfully submitted that all grounds of rejection and objection have been avoided and/or traversed. It is believed that the case is now in condition for allowance and same is respectfully requested.

If any issues remain, or if the Examiner believes that prosecution of this application might be expedited by discussion of the issues, the Examiner is cordially invited to telephone the undersigned attorney for Applicant at the telephone number listed below.

Also being filed herewith is a Petition for Extension of Time to October 22, 2004 with the appropriate fees. Authorization is given to charge payment of any additional fees required, or credit any overpayment, to Deposit Acct. 13-4213.

Respectfully submitted,

By:



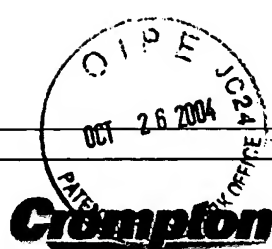
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p,p'-oxybis(benzenesulfonylhydrazide)

OBSH

Crompton

Product Description:

Celogen® OT is a low-temperature foaming agent suitable for operating temperatures of 300-350°F (149-177°C). It is recommended for rubber, LDPE, EVA, and soft vinyl compounds. Its white color makes it a good fit for low-temperature applications where whiteness is important. Celogen® OT generates a polymeric, non-polar residue that does not interfere with electrical properties in wire insulation applications. Process temperatures should not exceed 350°F (177°C) when using Celogen® OT. Materials such as triethanolamine and urea are strong decomposition activators. Zinc oxide and similar materials provide moderate to weak activation. Celogen® OT is oil-treated to reduce dustiness. It has three FDA sanctions for use in food-contact applications.

Physical Properties:

PROPERTY	TYPICAL VALUE
Physical Appearance	White to off-white powder
Decomposition Point	320°F (160°C)
Specific Gravity	1.55
Bulk Density	31 lbs./cu. ft.
Gas Composition	Nitrogen, steam
Gas Evolution	120-125 cc/g
Flammability	Flammable Solid N.O.S.

Product Contact